ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Abaco Systems / VMIC VMIVME-4941-024* at our website: ***Click HERE***

VMIVME-4941
Quad-Channel Synchro/Resolver-to-Digital Converter

- Quad S/D or R/D converters (single channel option)
- Tracking rates up to 800 rps minimum (48,000 rpm) for resolvers or 160 for synchros
- Software-programmable resolution (10-, 12-, 14-, or 16-bit)
- Software-programmable bandwidth (530 Hz, 130 Hz)
- 16-bit pitch counter per channel
- 8-, 16-, or 32-bit data transfer
- Reference frequency from 360 Hz (low bandwidth) to 6 kHz for resolvers
- Accuracy to ±2.3 arc minutes available (optional)
- Double Eurocard form factor
- Functional Built-in-Test capability for resolver input options
- LEDs indicate signal present, error exceeds 65 bits, and board fail

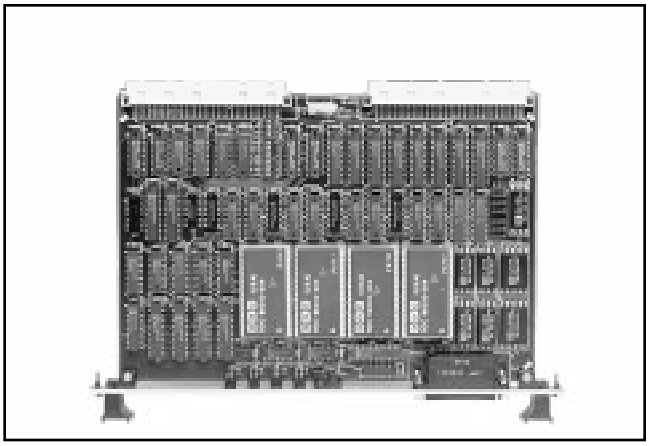
INTRODUCTION — The VMIVME-4941 is a quad-channel Synchro/Resolver-to-Digital Converter designed for use in modern high-performance commercial and industrial control systems. Applications include motor control, radar antenna position information, CNC machine tooling, robot axis control, and process control.

The VMIVME-4941 utilizes four versatile state-of-the-art Synchro or Resolver-to-Digital Converters featuring programmable resolution and bandwidth. Programming allows selection of 10-, 12-, 14-, or 16-bit resolution, and options are available with accuracy to two minutes +1 LSB (+4 LSB differential linearity). Resolution programming combines the high tracking rate of 10-bit converters with the precision of 16-bit converters.

The Quad Resolver-to-Digital Converter Board is designed with functional test capability for operational verification of all resolver hybrid modules and the VMEbus control logic. The user may provide an input resolver test signal through the P2 VMEbus expansion connector for board testing. A front panel Fail LED is illuminated at powerup and may be extinguished via program control after diagnostics are successfully executed. Front panel status indicators are also provided to indicate a loss of signal and level of error faults.

FRONT PANEL FAIL LED — If an error condition occurs during a board diagnostic test, a software-controlled LED may be used to visually indicate a failure. The LED is illuminated upon powerup reset and can be extinguished under program control.

BUILT-IN-TEST (RESOLVER OPTIONS ONLY) — Requires a user-supplied resolver input on the P2 connector for loopback testing. Loopback testing applies only for single-ended signal input operation. Note the 11.8 V signal input option can be jumpered to operate in a direct input mode. Status LEDs are also provided to indicate a loss of signal and level of error for each channel. The accuracy of loopback testing is limited (20 LSB) since the internal DC reference voltage from the channel zero resolver module is used for all four channels during Built-in-Test operation.



FUNCTIONAL CHARACTERISTICS

Compliance: This product complies with the VMEbus specification Rev. C. 1 with the following mnemonics:

A16: D32, D16, D08 (EO): 29, 2D: Slave
6U form factor

VMEbus Access: Address modifier bits are decoded to support nonprivileged short I/O and supervisory short I/O access (switch selectable).

Ordering Options

Dec. 11, 1998 800-004941-000 E	A	B	C	–	D	E	F
VMIVME-4941 –				–			

A = Configuration*
0 = 11.8 V, 2 Percent Linear (Differential 4-Wire Resolver Signal Inputs)
1 = Reserved
2 = 2 V, 2 Percent Linear (Direct 2-Wire Resolver Inputs)
3 = Reserved
4 = 11.8 V, 2 Percent Linear (Synchro Inputs)
6 = 90 V, 2 Percent Linear (Synchro Inputs)

B = Accuracy
0 = Reserved
1 = 8 min + 1 LSB (12 LSB Differential Linearity)
2 = 4 min + 1 LSB (8 LSB Differential Linearity)
3 = 3 min + 1 LSB (4 LSB Differential Linearity)
4 = 2 min + 1 LSB (4 LSB Differential Linearity)

C = Number of Channels
1 = Single Channel
4 = Four Channels

*Contact the factory for velocity output, voltage scaling, and control transformer mode (refer to ILC Data Device Corporation's *Synchro Conversion Handbook*, p. 105).

Connector Data

Compatible Cable Connector	AMP 747322-2
Strain Relief Kit	Type D
PC Board Connectors	AMP 206584-1

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
E-mail: info@vmic.com Web Address: www.vmic.com
Copyright © January 1986 by VMIC
Specifications subject to change without notice.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Register Addressing: S/R data (16 bits) and pitch counter (16 bits) can be read as a single 32-bit doubleword. All registers can also be accessed as 16-bit words or 8-bit bytes.

BOARD CONFIGURATION

Board Address: The physical address for the board is determined by the setting of an 11-bit DIP switch. VMEbus address lines A05 through A15 are decoded for board selection.

A15 to A5: Selected with DIP switches

A4 to A0: Used for register selection (refer to Table 5)

RESOLVER INPUTS

Reference Voltage Input: 4 to 50 VRMS

Reference Input Impedance: 100 K, single-ended

Reference Input Frequency: 0.36 to 6 kHz (see Table 1)

Signal Voltage Input: 2.0 VRMS for direct 2-wire input option (2.3 V maximum)
11.8 V for differential 4-wire input option

Signal Voltage Maximum without Damage: 15 V maximum, 110 V peak transient

Signal Input Impedance: 80 kΩ

SYNCHRO INPUTS

Reference Voltage Input: 4 to 130 VRMS

Reference Input Impedance: 110 k nominal, 100 K minimum, single-ended

Reference Input Frequency: See Table 2

PHYSICAL/ENVIRONMENTAL

Temperature Range: 0 to +55 ˚C, operating
-20 to +85 ˚C, storage

Relative Humidity Range: 20 to 80 percent, noncondensing

Cooling: Forced air convection

Power Requirements: +5 V at 2 A
±15 V (5 percent tolerance) at 100 mA[1]

TRADEMARKS

SRTbus is a trademark and the VMIC logo is a registered trademark of VMIC. Other registered trademarks are the property of their respective owners.

1. External power (±15 V) required.

Table 1. Dynamic Characteristics for Resolver Option

		HIGH BANDWIDTH RESOLUTION Bits				LOW BANDWIDTH RESOLUTION Bits			
PARAMETER	**UNITS**	**10**	**12**	**14**	**16**	**10**	**12**	**14**	**16**
Input Frequency	kHz	1 to 6	1 to 6	2 to 6	NR	.36 to 6	.36 to 6	.36 to 6	2 to 6
Tracking Rate	RPS†	800	200	50	12.5	200	50	12.5	3.2
Bandwidth	Hz	530	530	530	530	130	130	130	130
K a*	1/sec^2	1.4 M	1.4 M	1.4 M	1.4 M	90 K	90 K	90 K	90 K
A1*	1/sec	8	8	8	8	2	2	2	2
A2*	1/sec	178 K	178 K	178 K	178 K	45 K	45 K	45 K	45 K
A*	1/sec	1,200	1,200	1,200	1,200	300	300	300	300
B*	1/sec^2	600	600	600	600	150	150	150	150
Accuracy - 1 LSB Lag	°/sec	500	128 K	32 K	8 K	32 K	8 K	2 K	500
Settling Time	msec	10	15	30	75	40	60	120	300

† = RPS minimum.
NR = Not recommended (unit will jitter).
*Refer to ILC Data Device Corporation's specification sheet on the RDC - 1920X modules.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Table 2. Dynamic Characteristics for Synchro Option

		HIGH BANDWIDTH RESOLUTION Bits				LOW BANDWIDTH RESOLUTION Bits			
PARAMETER	**UNITS**	**10**	**12**	**14**	**16**	**10**	**12**	**14**	**16**
Input Frequency	kHz	.36 to 1	.36 to 1	.36 to 1	.36 to 1	.047 to 1	.047 to 1	.047 to 1	.047 to 1
Tracking Rate	RPS†	160	40	10	2.5	40	10	2.5	0.62
Bandwidth	Hz	53	53	53	53	13	13	13	13
K a	$1/sec^2$	14.4 K	14.4 K	14.4 K	14.4 K	3.6 K	3.6 K	3.6 K	3.6 K
A1*	1/sec	0.4	0.4	0.4	0.4	0.1	0.1	0.1	0.1
A2*	1/sec	36 K	36 K	36 K	36 K	9 K	9 K	9 K	9 K
A*	1/sec	120	120	120	120	30	30	30	30
B*	1/sec	60	60	60	60	15	15	15	15
Accuracy - 1 LSB Lag	$°/sec^2$	17 K	4.2 K	1.1 K	260	1.1 K	260	66	17
Settling Time	msec	110	110	200	500	550	600	750	1,100

† = RPS minimum.
*Refer to ILC Data Device Corporation's specification sheet on the SDC - 190204 (Figure 17).

Table 3. Synchro and Resolver Accuracy Versus Resolution

ACCURACY (MINUTES)	10-bit	12-bit	14-bit	16-bit
±2 + 1 LSB	23.1	7.3	3.3	2.3
±3 + 1 LSB	24.1	8.3	4.3	3.3
±4 + 1 LSB	25.1	9.3	5.3	4.3
±8 + 1 LSB	29.1	13.3	9.3	8.3

Table 4. Synchro Signal Input

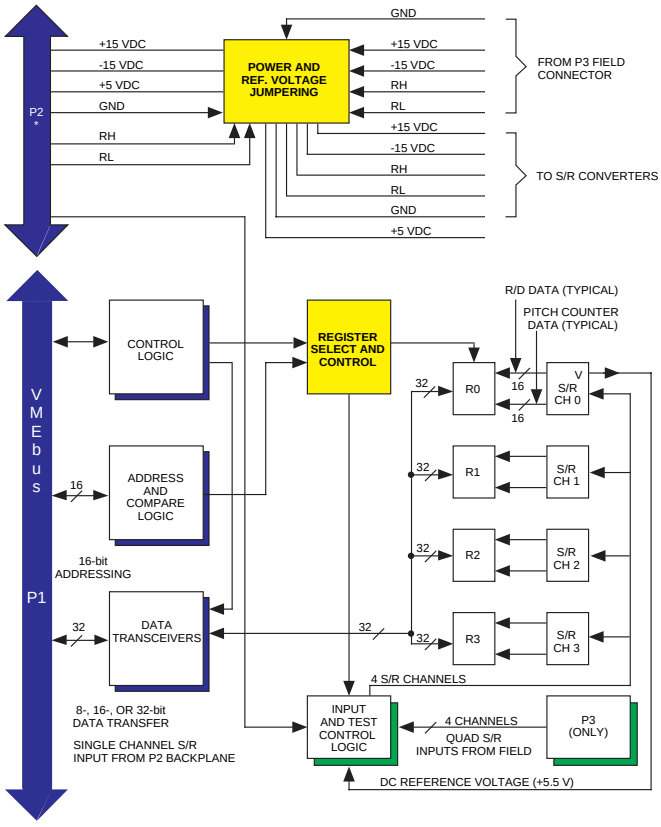
	VOLTAGE OPTION (SEE ORDERING OPTIONS)	
	11.8 VL-L	**90 VL-L**
Common-Mode Range	25 V Maximum	180 V Maximum
Z_{IN} Line-to-Line	52 kΩ	123 kΩ
Z_{IN} Each Line-to-Ground	70 kΩ	180 kΩ

Table 5. Register Word Address Map*

ADDRESS OFFSET		REGISTER MNEMONIC	REGISTER FUNCTION	CHANNEL NO.
HEXADECIMAL	BINARY A4 A3 A2 A1 A0			
00 02	0 0 0 0 0 0 0 0 1 0	PC0 SRD0	PITCH COUNTER S/R DATA	0
04 06	0 0 1 0 0 0 0 1 1 0	PC1 SRD1	PITCH COUNTER S/R DATA	1
08 0A	0 1 0 0 0 0 1 0 1 0	PC2 SRD2	PITCH COUNTER S/R DATA	2
0C 0E	0 1 1 0 0 0 1 1 1 0	PC3 SRD3	PITCH COUNTER S/R DATA	3
10	1 0 0 0 0	CSR	CONTROL AND STATUS	—

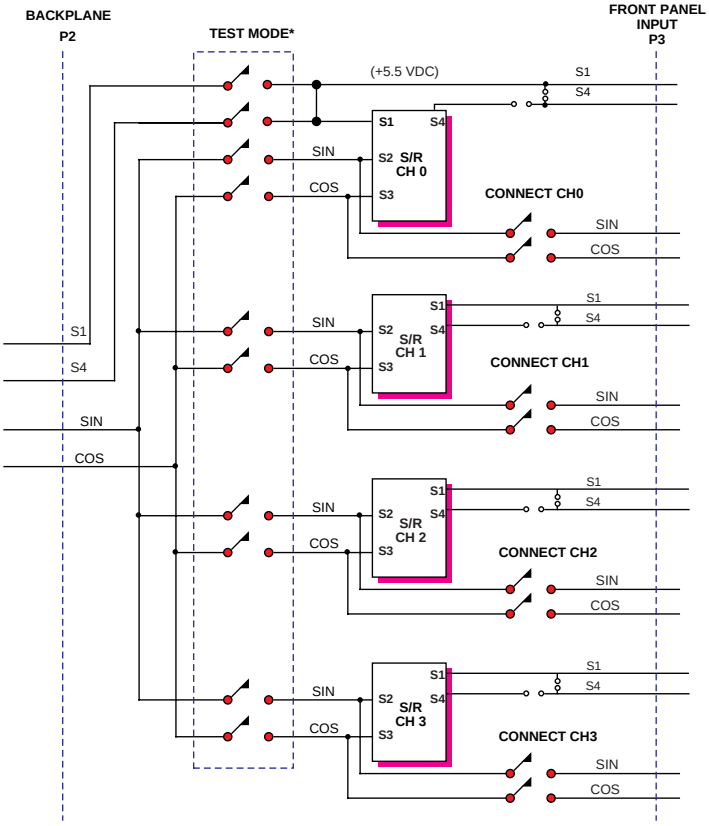
*Pitch counter and R/D Registers are concatenated on longword transfers such the pitch counter is read as the most significant word (D16 through D31). Pitch counters, R/D Registers, and CSRs are also byte addressable.

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com



*VMIC's SRTbus™ or VMEbus P2 backplane.

Figure 1. VMIVME-4941 Functional Block Diagram



*One Control and Status Register (CSR) bit controls all connections to P2.

Figure 2. Test Configuration

For Ordering Information, Call: 1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859

Artisan Scientific - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisan-scientific.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP